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ABSTRACT

Special libraries in Southern California and the San Francisco Bay Area who were members of the University of Southern California (USC) School of Engineering Industrial Associate program were surveyed on their use of the USC program and other similar programs. The questionnaire was designed to discover the attitudes and needs of the Industrial Associate members in California toward USC's library service. It was found that proximity to the parent university and the size of its collection were the prime determinants of special library use. A further analysis by size of special library staff showed that larger libraries tended to use USC's Industrial Associate Programs more than smaller libraries and also to be more aware of specialized information resources within their area. As a result of the survey recommendations were made concerning fee structures, financial support of the library, photoduplication, and communications among the Industrial Associates users, the Industrial Associates office, and the library. Appendices include the questionnaire, tabulation of responses, USC Library Guidelines, a 41-item bibliography, and a copy of the Industrial Association Brochure. (Author/DS)

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Library Service to Industry at USC: the Industrial Associates of the School of Engineering

A Report
Presented to the School of Library Science
University of Southern California

In Fulfillment
of the Requirement of
Library Science 590

By
Katherine A. Frohmberg
May 27, 1975

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This project was completed while a part-time library student at the University of Southern California and a full-time Library Assistant in the Reference Department of the USC Doheny Library. As my duties included Interlibrary Loan and telephone reference, I was able to deal with the special libraries studied here on a day-to-day basis as well as on the special basis determined by this project.

The direction for this project was provided by Professor Edward J. Kazlauskas and Professor Thomas Shaughnessy of the USC School of Library Science. Their able assistance and guidance were essential to the successful completion of this project.

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I. INTRODUCTION

With all libraries showing concern for rising costs and the impossibility of acquiring everything which may have pertinence to a research need, special libraries are in a particularly tight situation. Their problem is aggrevated by the tendency of many corporations (especially the aerospace companies in Los Angeles) to expand into other fields, particularly environmental topics. The demand may one week be semi-conductors and the next sewage disposal.

Industrial libraries meet this increased information demand in many ways, one of which is through the use of large university and public libraries in the area.

Different types of libraries have differing attitudes towards this use of facilities. Most public libraries, as public institutions, regard industry as a clientele they are required to serve and do their best to help them out. Unfortunately the typical materials held at a public library are insufficiently technical or specialized for the needs of industry. Industry is then forced to go to college and university libraries which have the technical materials they need.

Universities supported by public funds are frequently required to issue borrowing cards and extend other privileges

to industry with minimal compensation in return. Private universities, however, can arrange their services to industry in any manner they please and it is with the private universities that one finds the typical programs which charge for services rendered.

Many formalized plans exist in the U.S. and Great Britain for service to business by libraries. A general model can be made of such typical library service:

1) Payment for services rendered in the form of an annual membership fee or on a per transaction basis.

2) Fast and efficient borrowing of circulating materials, frequently through some simplified interlibrary loan process or with actual borrowing cards issued.

3) Fast delivery of materials through a shuttle or messenger service.

4) Extensive photocopying, often facilitated by deposit accounts, photocopy coupons or a minimum number of free copies covered by a membership fee.

5) Other services sometimes offered include literature searching, indexing and abstracting, and a full time librarian available for industry use, either to be divided among several companies or attached to one company and physically located at the library.

The January, 1966 issue of Library Trends discusses the state of library service to industry in extensive and complete detail. In particular, Natalie Nicholson's article (Item 22 on the attached bibliography) describes the relationship of

business to college and university libraries. She discusses developments since her 1962 article and some of the services now in existence. Her 1962 Library Trends article (Item 21) discusses the historical development of this relationship, the types of service required by industry, and the difficulties and benefits involved in this relationship. Since the middle 1960's, not much has been published on the problem of service to industry and the 1966 issue of Library Trends is probably still indicative of the state of the art. The cutbacks in library funds have been the major cause of most of this lack of expansion. In addition, there are a number of pilot studies for various types of services in the literature which have never materialized as working programs.

The study by North (Item 23) was contracted by the National Advisory Commission on Libraries and is the main nationwide study of information needs of business. The study covered many facets of the relationships of libraries to industry but its discussion of existing programs is clearly derived from the Nicholson articles. North recommends that more statistical data be collected on this issue as little is understood about the relationships of industry to libraries.

In Southern California, two background studies have examined the relationship of industry to libraries, but their focus has been on the public library. George S. Bonn's report to the California State Librarian (Item 5) was aimed at ultimate funding by the State Technical Services Act. The study by Meyer (Item 18) studied the needs of the business

communities of Pasadena and Pomona. Insufficient distinction seems to have been made in these studies between the two types of business needs: for technical and non-technical data. In Southern California in particular there exist a large number of corporations which do scientific research as part or all of their output. The above studies are probably aimed at the non-technical service needs of business, but the problem is not sufficiently discussed.

Without a significant change in direction, it is clearly impractical for a public library to carry Chemical Abstracts and other related and expensive scientific abstracting services which a university would carry as a matter of course. Given the current state of library funding, college and university libraries will probably continue to fill the technical needs of business and public libraries at least partially fill the non-technical needs.

The study done at Harvey Mudd College (Item 13) for a joint college/industry library which is intended from its inception to serve both clienteles, takes advantage of this division of resources. The industry in the Claremont area was examined and Caltech's interlibrary loan analyzed to determine a minimum number of periodical subscriptions which would satisfy most of the information needs of industry, but which would largely be items carried by Harvey Mudd as an engineering school. The college planned to have these periodicals subject indexed in-house, and have a computer available to run searches with 24-hour turnaround. This

proposed project did not take advantage of the computer tape services which are now available, and obviously would have been a very expensive undertaking. The study indicated a need among industry for this type of service, but the cost would have been very high--several thousand dollars per year per company.

The most immediate reason for failure of this program was lack of initial funding, but I wonder if it would not have been even more difficult to sell this service to industry in the area. Industry has always shown a willingness to pay for services rendered and usually does not object to fair and reasonable library fees. However, it is very difficult to convince the industry which has been managing without this additional cost, whether managing poorly or not, that they need a large dollar outlay for information.

However, if the proposed industrial clientele can be gleaned from an established interest group on campus or in the library, the selling and advertising job is considerably reduced. A captive clientele which has already shown an interest in the institution will usually be easier to deal with.

This captive clientele typifies the USC Industrial Associate Program. USC's School of Engineering has a support group called the Industrial Associates which donate $5000 or more per year to the School. In return, the School gives its members the following privileges (see attached brochure):

1) Access to faculty members for consultation.

2) Free copies of School of Engineering Research Reports

3) Invitations to school seminars and conferences

4) Use of the school's physical facilities

5) Library privileges

The School of Engineering also sponsors an Industrial Support group which donate $1000 to $3000 per year. .The thirty members have much the same privileges as the Industrial Associates, but they must ask for library privileges, they are not informed of them. For this reason, the Industrial Support group is not considered in this project.

There were sixty-two corporate members of the Industrial Associates in February 1975, the beginning of this project. Forty-one of these members have two hundred libraries listed in the Third Edition of Directory of Special Libraries and Information Centers. Seventy-six of these libraries are located in California. These libraries already have a tie with USC through their Industrial Associate membership privileges and their physical proximity, whether they use the library or not. It is this captive clientele I investigated.

The project, therefore, had three goals:

1) To discover, through the use of a mailed questionnaire, the attitudes and needs of the Industrial Associate Libraries in California towards USC's library service;

2) To make specific recommendations to the Industrial Associate office and the library administration for expansion or re-arrangement of the existing situation;

3) To compile an up-to-date file of existing library services to business and industry across the country which would serve as a body of comparison to USC's program.

II. THE PROJECT

A. The Questionnaire

As mentioned above, there are about 200 libraries attached to forty-one companies which are Industrial Associate member libraries.

Of these 200, forty-five (thirty in California and fifteen out of state) were receiving regular mailings from the Industrial Associate office before the project began and presumably were at least aware of the existence of the Industrial Associate program, if not of the attached library privileges. The remaining 150 libraries may or may not have known of this program. Forty-six of this 150 are in California.

The questionnaire was mailed to the seventy-six total libraries in California and not to the out-of-state libraries because of the importance of proximity in any library use. It is clearly impractical to have a USC library card when the library is based on the East Coast, and interlibrary loan service is usually faster at the nearest large research center. Thus, the out of state Industrial Associate member libraries would have little opportunity to use the USC facilities, even if they did know of the privileges. As mentioned before, a questionnaire was not sent to any members of the Industrial Support group.

The questionnaire itself is attached to this report. It was discussed and approved by several offices: the Industrial Associate office, Robert Haro of the Librarian's Office in Doheny, Jane Rowe of the Science Library, and Rod Casper of Caltech who made suggestions based upon the Caltech Industrial Associate program which is similar to USC's.

All costs were underwritten by the Library.

The questionnaires were mailed on Friday, January 24, 1975. I began receiving responses almost immediately, especially telephone calls. I received calls from a few libraries to the effect that their company denied sending USC any money for the Industrial Associate program in the past few years and hadn't I made a mistake in mailing them a questionnaire? It was at this point that I found out that the Industrial Associate office will continue mailings to a company regardless of how long it has been since they paid any money. Had I known this at the beginning, I would have tried to structure the questionnaire a little differently.

I received forty-one responses on the first mailing and sent a second mailing with a new cover letter on Wednesday, February 28, 1975, which produced eighteen responses. After a suitable period of time, I telephoned those libraries in the area which had not responded and which I knew from personal knowledge would not be upset by a phone call. I found, for example, that one library had an incorrect mailing address. The phone calls produced three responses.

On March 25, 1975 I mailed to the respondants the informational materials they had requested: the USC Students Library Guide, a map of the campus and list of libraries, applications for borrowing cards, and information on the USC Union List of Serials. In some cases where I felt their responses and comments were appropriate, I mailed individual letters to the respondants. The letters dealt with such matters as clarification of their responses, an explanation of how USC's Interlibrary Loan will lend books in print under most circumstances, and requests for more information on the two charging services of which I had been unaware at the beginning of the survey--Barbara Lindermann and Mary Ann Devine. Copies of these letters are attached.

As a result of the March 25 mailing, the library issued about a dozen borrowers cards. The Union List of Serials was sold out for this semester before any Industrial Associate library would have had a chance to order it, but the high interest expressed in ordering information on the List leads me to believe that many copies will be sold in the future. The mailing has also resulted in increased contact between USC and the Industrial Associate libraries. Hoffman Electronics wrote me concerning our technical report holdings and their availibility on Interlibrary Loan. TRW phoned me regarding our policy of denying any photocopy request which does not specifically state that photocopy or microfilm is desired. On the other hand, one librarian tried to place interlibrary loan request by phone and was somewhat upset when I refused to do so. I trust I explained the matter to his satisfaction.

The month of April was spent compiling guidelines for use of the USC Libraries by Industrial Associate members. This involved an explanation of library card, interlibrary loan and photocopy privileges. It is interesting to note that before this document, there seems to have been nothing written about the library card policies to Industrial Associate libraries. The draft guidelines were discussed with the Micrographics Department, the Science Library, Circulation Department, Interlibrary Loans, and the University Librarian. The result was then submitted to the Industrial Associate office. At that time, they indicated they did not want publicity on any subsidized xeroxing which they may occasionally provide. The Guidelines will be held in the Librarian's Office and the Industrial Associate office. They will be mailed to any new Industrial Associate member and to any Industrial Associate member which requests a library card.

On May 19, the Guidelines were mailed to all Industrial Associate libraries, whether they were respondants or not. Also mailed were parts I and IV of the tabulation which twenty libraries had requested. There were ten libraries which had responded but were not on the regular Industrial Associate mailing list, and these addresses were transmitted to the Industrial Associate office for placement on the mailing list.

The tabulation was also mailed to Rod Casper and Jeanne Tatro of Caltech's Interlibrary Loan and to Bonnie Pelner, the largest charging service in the area. Bonnie

phoned on May 23 and suggested I send the tabulation to Barbara Lindemann (whose name I misspelled on the tabulation) and to Information Unlimited.

On March 12, 1975, I received a call from James B. Dodd, Coordinator of Service to Business and Industry at Georgia Institute of Technology. He had somehow received a copy of my questionnaire and wanted me to send him my results. He is giving a paper at SLA in June on charging services across the country. I mailed him a copy of Parts I and IV of the tabulation.

After this project report is submitted, I plan to meet individually with Mr. Kidman, the University Librarian, and with Dr. Marshall of the Industrial Associate office to discuss the recommendations contained herein.

B. The Tabulation

As noted on the tabulation of responses, there was an 80% overall response to the questionnaire. Of the seventy-six total questionnaires mailed, sixty responses were received, of which forty-seven were usable. Unusable responses included two duplications of addresses, two libraries which were disbanded, and several libraries which had separate entries in Kruzas but which were actually one library.

In order to discover characteristics about these libraries which might explain their responses, I compared many questions to each other. Questions 5 - 8 and 14 - 29 were compared with length of time as an Industrial Associate library with no results. I also compared number of library cards to library use and found no correlation. I suspect that the library cards issued are now several years old. It was not feasible to compare subject areas of these libraries to use because all of the respondants fall into the general "sci/tech" category and any further breakdown becomes too complicated. There was further no way of judging what proportion of the collections were assigned to any subject listed.

It soon became apparent that distance from USC and size of library staff were the most important factors in distinguishing responses. I then divided the tabulation

into "near" and "far" libraries to show how distance effects responses and compiled Part IV to show how size of library staff effects responses.

The tabulation was therefore organized as follows: Part I, Tabulation of all responses including comments. Part II, tabulation of Los Angeles/Orange County responses. Part III, Tabulation of Bay Area/San Diego responses. A Santa Barbara and a San Diego library were included in the Bay Area responses because their answers resembled Bay Area responses more closely than Los Angeles/Orange County responses.

Part IV is a tabulation of the Los Angeles/Orange County responses by size of library staff for a selection of questions. A similar table for the Bay Area/San Diego responses failed to produce any interesting results.

In addition to showing how size of staff effects responses, Part IV is a digest of the most interesting group of responses, Los Angeles/Orange County. It is the intent of this discussion of the tabulation to focus on these questions and perhaps provide some rationale for the nature of the responses.

An explanation of the various parts of Part IV are contained on the introductory page. I divided the responses into "large" libraries with staffs of four or more, and "small" libraries with staffs of three or less. This division is made only to provide some very general comparisons between the behavior of the larger and smaller libraries.

No great truths about the behavior of special libraries in general is intended. In that spirit, then, one can see that larger libraries tend to be more involved in information activities in the area, including USC's Industrial Associate program. This will be further discussed later.

Some general conclusions can then be drawn from the tabulation:

1. About half the respondants were unaware that they had library privileges through the Industrial Associate program, but almost all intended to make use of their privileges in the future, especially interlibrary loan.

2. There was a wide interest in informational material about USC: the USC Union List of Serials, printed materials about the libraries, and the card catalog/information number.

3. Present use of USC by these libraries through interlibrary loan and library card is very slight. The one company which extensively uses USC, Southern California Edison, does so because they are fairly close and the librarian which checks out the materials is a USC library school graduate. There is reason to believe that relatively small use of USC Libraries by the Industrial Associates is not atypical for this type of program. I have read, but am unable to relocate, that Caltech and/or MIT's Industrial Associate library use breaks down into a large percentage of the library use going to a small number of libraries. USC's pattern is similar, with one library using us heavily.

4. UCLA and Caltech are by far the most heavily used libraries in the area by these companies for interlibrary loan. Reasons include convenience, use of Pelner, and Caltech's Industrial Associate program which gives a minimum number of transactions and photocopies free.

5. That information services which charge for books and photocopies delivered are important information sources for 75% of the respondants.

6. All the libraries generally fit into the "sci/tech" category with emphasis on electronics, aerospace, petroleum geology and engineering.

7. That about half the respondants wanted a copy of the tabulation.

8. That size of library staff seems to be an important factor in the behavior of these libraries.

Any discussion of why USC is lightly used and UCLA and Caltech are heavily used by special libraries calls for an explanation of the techniques industrial libraries seem to use in locating information.

The current method of finding material on interlibrary loan by special libraries is to send the request to the closest and largest institution likely to have the material. Notice that convenience is the most frequently given reason for use of UCLA and Caltech. This method works fine until the large institutions are so overloaded they cannot handle what they receive. Thus, Caltech has instituted a prohibitively high interlibrary loan service charge for any

industry library which is not one of their Industrial Associates. At UCLA, on the other hand, charging services such as Pelner and Lindemann have evolved which contract out to any library. Maryann Devine, however, contracts to only one library.

It is only after the above methods have failed that the technical library turns to smaller information resources in the area or perhaps writes further away to larger libraries such as Linda Hall or Engineering Societies Library.

The result is that all the large institutions in the country are receiving all the borrowing requests. This issue has been of great concern to interlibrary loan librarians. A good proportion of materials commonly requested are held by medium-sized institutions such as USC or the state colleges and public libraries, but they rarely receive borrowing requests because their collections are much less known.

On June 2, 1975, SCILL (Southern California Interlibrary Loans) will be operational for any library in Los Angeles county. This network will try to reverse the trend of using the largest libraries first for material which is probably held all over the city (including at USC) and will further provide the delivery system many Industrial Associate libraries indicated they needed. SCAN (Southern California Answering Network) at Los Angeles Public Library will attempt to find a location for a desired work using their extensive knowledge of the resources in Los Angeles County and will

only use UCLA as a last resort. If the network is successful, there should be a much better distribution of interlibrary loan requests of all types, special, academic and public, in Los Angeles county.

If the Industrial Associate libraries take advantage of this network, there will be a larger use of USC almost by default.

While locating needed material at the local level before trying the largest institutions has always been a goal of interlibrary loan, it has not always been practiced to the extent that it should, especially in small institutions such as special libraries which cannot afford to purchase expensive locating tools. It is my belief that a network like SCILL is the only practical method of significantly changing the interlibrary loan flow in an area like Los Angeles County. With SCAN performing the locating of resources, the requests can be more equitably distributed.

The other essential characteristics of these Industrial Associate libraries as shown in Part IV, use of charging services, other Industrial Associate memberships, computer searching services, and interest in other information materials like the USC Serials list, can then be approached by size of library staff.

Part IV shows that as one progresses from the largest to the smallest library in this group, the libraries show a decreasing use (or perhaps need) of information in the

area (i.e. charging services and searching services) and a decreasing amount of interest in what is available (i.e. serials list and tabulation). I am perhaps biased in basing my judgment of interest in whether or not a respondant wanted a copy of my tabulation, but a survey such as this is one way of discovering what is available in the area.

It is my further impression that participation in library activities in the area makes a good deal of difference in the awareness of the librarian of the local materials. In general, the larger libraries and those librarians of small libraries whose name I recognized from local SLA activities showed a greater awareness in their responses of the information resources in Los Angeles.

III. THE RECOMMENDATIONS

One of the goals of the project was to find some method of convincing the Industrial Associate office that they needed to provide financial support to the library for the Industrial Associate program. Mr. Kidman indicated to me that the structure of the University's budgeting system is such that there is no chance of this happening. Further, the low use of USC by these libraries makes it even more difficult to present a compelling case for financial support.

In spite of the above problem, a number of changes in the relationship between the Industrial Associate office and the library have already been instituted.

1. The Industrial Associate office will now automatically notify Interlibrary Loans, Photoduplication, Circulation and the Librarian's Office of any new Industrial Associate member. This had not been a regular practice in the past. This is particularly important for the Circulation Department as they are now able to verify immediately if an applicant for a library card is eligible under the Industrial Associate program.

2. Photoduplication now sends all Industrial Associate xerox bills to the Industrial Associate office for any possible subsidizing of bills which the Industrial Associate

office may decide to do. Previously, only those libraries which happened to send their interlibrary loan request to the Industrial Associate office would get occasional xerox subsidizing. Those libraries which sent their requests to the Industrial Associate office and not to interlibrary loans were usually those libraries which were so small that their experience with general interlibrary loan practice was very limited. Any large special library would automatically send their requests to Doheny. Thus, under the new arrangement, all Industrial Associate libraries have an equal chance at whatever subsidized xeroxing the Industrial Associate office may extend.

3. There now exists a document which sets out library practice as it specifically applies to Industrial Associate libraries. This document will be sent to all new Industrial Associates and to any Industrial Associate which requests a library card.

Recommendations which I would like to see implemented are as follows:

1. As mentioned previously, the Industrial Associate office will keep on their mailing list any company which was once an Industrial Associate regardless of how long it has been since they paid the Industrial Associate membership fee. However, my results show that a large number of USC Industrial Associate members are also members of Caltech's Industrial Associate program--a considerably more extensive program. Caltech's yearly fee is $15,000.

Twenty-five companies which are USC Industrial Associates had libraries in California and thus received a questionnaire. I received responses from twenty-one of these companies. Fifteen of the twenty-one companies are also Caltech Industrial Associates. If this high a proportion of duplicate Caltech and USC Industrial Associate memberships is true for all the 62 USC Industrial Associates, then USC could certainly consider making its $5000 fee mandatory for each year or perhaps even raise the cost of the program. This would be one method of avoiding library privileges to a company which is really of no benefit to USC in a material way.

If the Industrial Associate office chooses not to make a yearly fee mandatory for membership in the Industrial Associate program, I would recommend distinguishing between those paid and nonpaid members and allowing the library to refuse them library privileges. The Library receives no reimbursement for the Industrial Associate library privileges and, according to Mr. Kidman, can expect none in the future. The University charges $120 per year for a library card to be issued to a non-Industrial Associate company. There is no reason this charge should not be extended to a company from whom we once had an Industrial Associate fee and are only keeping on the mailing list on the expectation they will pay more some time in the future.

2. A further recommendation deals with the occasional subsidized xeroxing. While the present situation is more equitable in that any library which sends a request to USC

has a chance at subsidized xeroxing, there are still many libraries who would, obviously, use us more if they knew some of their bills would be paid by the Industrial Associate office. I would recommend that the Industrial Associate office set a fixed amount of subsidized xeroxing and advertise that amount. Of course, the problem of an annual fee would have to be considered along with this. Librarians base their use of other libraries on the treatment they receive. An Industrial Associate library may receive subsidized xeroxing for a few orders and then have to pay for an order because it was very large. The Industrial Associate library has no way of then knowing if their subsidized xeroxing has run out or if there is some other factor stopping the subsidy. It would be much fairer if each library knew if they had a specified amount of free xeroxing and could plan accordingly.

3. The Industrial Associate office will process book loans if an Industrial Associate library sends a request to them. I would recommend that any request which looks as if it needs to be denied, should be sent to Interlibrary Loans in Doheny for further searching. I did have a few comments from Industrial Associate librarians indicating the Industrial Associate office had incorrectly denied requests which were later found to be in the USC library system.

4. A recommendation which could be implemented by the Library or by the Industrial Associate office is photocopy coupons. I know from personal experience with

UCLA's photocopy coupons that they are of great convenience. However, UCLA will not issue coupons to libraries of profit making companies. Mr. Kidman indicated to me that he feels a universal coupon-type system will be implemented in the County in the next few years. However, the next few years is still a long time to benefit from the advantages of coupons.

5. My final recommendation is for a librarian to be available to Industrial Associate libraries for questions. Special librarians seem much more willing to deal with a university system if they are armed with the name of a person who is "their" librarian. My questionnaire has already given me this informal position and I receive frequent calls regarding procedures and resources in the USC system. There is no reason this person could not be one of the administrators in the Librarian's Office, but a person in Interlibrary Loans, Reference or the Science Library would have increased availability. The increased work load would not be extensive.

Someone further needs to take responsibility for updating the Guidelines and mailing them out at intervals (once a year?). Already I have discovered that the USC Union List of Serials will be increased in price next year and will include Caltech's serial holdings. This must be reflected in any information sent out about the Libraries.

IV. THE FILE

From about November, 1974 to March, 1975, I wrote to any program of library services to industry I could find in footnotes, conversations, etc. The result is a file of responses and brochures.

I am amazed at the variety these programs exhibit. In Britain, for example, the responsibility for information service to industry seems to lie with the public libraries and there are some extensive programs available. In the U.S., there is a much wider variety of programs. They range from Georgia Tech's program of literature searches, translations, and their catalog available on fiche, to U.C. Irvine's program which gives the member library nothing more than they already have as a user of a public university.

It was not the intent of this project to do any detailed analysis of this correspondance or the programs. I have read all the materials these libraries sent me and have greatly increased my knowledge of this type of program across the country.

It is clear, however, that many of the services these programs give are not feasible under the present working arrangements at USC, and it is simply unrealistic to suggest them. My recommendations I hope have at least the

advantage of being tailored to my knowledge of the situation at USC at this time.

The libraries from which I received brochures are as follows:

1. Industrial Extension Service at North Carolina State University at Raleigh.
2. Manchester Public Libraries, Commercial Library and Information Department.
3. Birmingham Library and Information Network, Birmingham Public Library.
4. Pennsylvania Technical Assistance Program (PENNTAP) at Pennsylvania State University.
5. Humberside Libraries Technical Interloan Scheme (HULTIS) in Great Britain.
6. Service to Business and Industry, Georgia Institute of Technology, Atlanta.
7. Industrial Associate program at California Institute of Technology.
8. Industrial Information Service, Southern Methodist University, Science Information Center.
9. Technical Information Service at Stanford University.
10. Liverpool and District Scientific, Industrial and Research Library Advisory Council (LADSIRLAC) at Liverpool Public Library
11. Rice University, Regional Information and Communication Exchange.
12. Associated Science Libraries at San Diego Public Library

13. Industrial Liason Program at Massachusetts Institute of Technology.

14. Information for Minnesota (INFORM) at University of Minnesota.

15. California State Library Service to Industry.

16. University of California Irvine Industrial Associates.

V. APPENDICES

A. The Industrial Associate Membership as of February, 1975

B. The Questionnaire

C. The Tabulation

D. The Guidelines

E. Bibliography of Sources Consulted

F. Industrial Associate Brochure

APPENDIX A

The Industrial Associate Membership as of February, 1975

APPENDIX A.

The Industrial Associate Membership as of February, 1975.

Aerojet-General Corporation
Aerospace Corporation
*American Hoist & Derrick Company
Atlantic Richfield Company
*Baker Oil Tools, Incorporated
*Cooper-Bessemer Company
+Combusion Engineering Incorporated
+Continental Oil Company
*Delta Southern Company
*Electronic Memories - Divn of Electronic Memories & Magnetics
+Firestone Tire and Rubber Company
+Fluor Corporation
FMC Corporation
General Dynamics Corporation
*Global Marine, Inc.
Getty Oil Company
*M.C. Gill Co.
+Goodyear Tire and Rubber Co.
Hewlett-Packard Company
*Hi-Shear Corporation
HoffmanElectronics Corporation
Honeywell, Inc.
Hughes Aircraft Company
IBM Corporation
*International Rectifier Corporation
+International Telephone and Telegraph Corp.
+Johns-Manville Corporation
*Joy Mfg Company-Western Precipitation Division
+Lear Siegler Incorporated
Litton Industries Incorporated
Lockheed Aircraft Corporation
*Lord Corporation
Los Angeles Department of Water & Power
Magnavox Corporation
*Marshall Industries
+Mobil Oil Corporation
*Monogram Industries
+National Cash Register Company
*Norco Construction Company
*Norris Industries
Northrop Corporation
Pacific Telephone & Telegraph Company
Ralph M. Parsons Company
*Petrolane Incorporated
+Reynolds Metal Company
Rockwell International

San Diego Gas and Electric Company
*Santa Fe International
*Signal Companies Incorporated
Singer-Librascope
*Smith International Incorporated
Southern California Edison Company
Standard Oil Company of California
+Tenneco Oil Company
+Texaco Incorporated
+Texas Eastern Transmission Corporation
TRW Incorporated
+Union Carbide Corporation
Union Oil Company
*VTN Corporation
Xerox Corporation
*Zurn Industries Incorporated

*Companies with no library listed in Directory of Special Libraries and Information Centers, 3rd edition.

+Companies with no library in California.

APPENDIX B.
The Questionnaire

1. Cover letter dated February, 1975
2. Cover letter dated March 1, 1975
3. The Questionnaire

UNIVERSITY OF SOUTHERN CALIFORNIA
UNIVERSITY LIBRARY
UNIVERSITY PARK
LOS ANGELES, CALIFORNIA 90007

746-2540

February, 1975

Dear Industrial Associate Library:

Are you aware of your company's Industrial Associate membership and of the library privileges it offers? Your responses and comments on the enclosed questionnaire will help give USC a better picture of your company's information needs and, at the same time, will give us a basis for evaluating our service to you.

The questionnaire is mailed under the auspices of the USC School of Engineering's Industrial Associate office and the Library administration. The results of the survey will be used to make recommendations to further expand and improve the library service being currently offered to Industrial Associate members.

Thank you for the ten minutes you invest in this project. If you would like a copy of the final tabulation, please so indicate on question 43. Your contribution will be gratefully appreciated.

Very truly yours

Katherine A. Frohmberg

Katherine A. Frohmberg
Interlibrary Loans

746-2540

UNIVERSITY OF SOUTHERN CALIFORNIA
UNIVERSITY LIBRARY
UNIVERSITY PARK
LOS ANGELES, CALIFORNIA 90007

March 1, 1975

Dear Industrial Associate Library:

A few weeks ago I sent out a questionnaire under the auspices of the USC School of Engineering's Industrial Associate Office and the Library administration. The results of this questionnaire will be used to give USC a better picture of your company's information needs and, at the same time, will give us a basis for evaluating our service to you.

Thus far, response has been most gratifying. However, there are many libraries which have not responded that I know would be interested in these services. Further, any recommendations for improvement of the library service to Industrial Associate libraries would be much strengthened by a large response from these libraries.

I have enclosed another copy of the questionnaire with the hope that I receive a response by March 15. If you would like a copy of the final tabulation, please so indicate on question 43. Your contribution will be gratefully appreciated.

Very truly yours

Katherine A. Frohmberg
Interlibrary Loans

PS: As fate would have it, I have received responses from two libraries who indicated interest in further information but did not indicate their name or address. If you are receiving this questionnaire for the second time and have already responded, please respond again and/or give me a call.

INDUSTRIAL ASSOCIATE LIBRARY SURVEY

QUESTIONS	ANSWERS
1. Are you aware that your company's USC Industrial Associate Membership entitles you to a) Library card with 4-week circulation privileges b) Three day interlibrary loan turnaround.	Yes ☐ No ☐ Not applicable Yes ☐ No ☐ Yes ☐ No ☐
2. Do you plan to take advantage of the USC libraries now that you know of your privileges?	☐ ☐ ☐
3. What type of library service do you think you might use in the future?	☐ Interlibrary Loan ☐ Library card ☐ Other: _____
4. Is there any specialized information about the USC Libraries we can send you which would facilitate this use?	☐ Map of campus ☐ Schedule of library hours ☐ USC Student's library guide ☐ Other: _____
INTERLIBRARY LOAN USE OF USC	
5. Number of books (or library materials other than photocopies)borrowed from USC?	____per year
6. What percentage is this of your total Interlibrary Loan borrowing?	____percent
7. Number of photocopies ordered from USC per year?	____per year
8. What percentage is this of your total photocopy ordering?	____percent
9. What is your opinion of the service given by USC's Interlibrary Loan?	☐ Excellent Service ☐ Average ☐ Poor ☐ No basis for opinion Comments: _____

QUESTIONS	ANSWERS
10. Are you aware that this year USC has a Union List of Serials which is available for purchase to other institutions?	Yes ☐ No ☐ Not applicable
11. Do you own it?	☐ ☐ ☐
12. How did you find out about it?	☐ Word of mouth ☐ SLA Meeting ☐ Other _____
13. Would you like to receive ordering information about it?	Yes ☐ No ☐ Not applicable ☐
LIBRARY CARD USE OF USC	
14. Is there a USC Library Card issued to your company library? If no, go to Question 20.	Yes ☐ No ☐
15. How many cards do you have?	____cards
16. How many books do you check out on the USC Card(s)?	____per year
17. Whom do you send to the USC Campus to check out these materials?	☐ Member of our library staff ☐ Non-library messenger ☐ Employee who wants the books ☐ Other _____
18. How many items do you photocopy at the USC Library (as distinguished from ILL)?	____per year
19. Which branches do you use when you check out books and photocopy. Please rank by indicating a "1" if most used, "2" if next used, and so on. Indicate "0" if not used.	____Doheny Library ____Seaver Science Library ____Crocker Business Library ____Other _____
20. Do you know of any USC library cards issued to company employees outside of your library?	Yes ☐ No ☐
21. How many of these individuals are there?	____persons with cards
TELEPHONE CONTACT WITH USC	
22. Do you ever phone the USC Libraries for reference questions and other telephone information?	Yes ☐ No ☐
23. How often do you phone?	times per month
24. Which branch do you find most often answers your question? Rank your choices as in Question 19.	____Doheny Library ____Seaver Science Library ____Crocker Business Library ____Other: _____
25. What percentage of your calls are answered to your satisfaction?	____25% ____50% ____75% ____100%
26. Are you aware that USC maintains a library information telephone number (213-746-6050) for card catalog and general library information from Monday to Saturday?	Yes ☐ No ☐

QUESTIONS	ANSWERS
27. If you were unaware of the service, do you plan to use it now?	Yes ☐ No ☐ If not, why not? _____
28. How often do you use it?	____per month
29. Assuming that you call other institutions for information, what percentage of your total library calls are directed to USC?	____percent
30. Are there any problems with the USC telephone service or any comments you would like to make?	
31. Would you have use for a phone answering machine which could tape record your message after library hours (10 PM - 8 AM weekdays)?	Yes ☐ No ☐ Not sure ☐
32. Is there any other way you use the USC libraries other than library card, xerox, Interlibrary Loan and telephone?	
33. What could be changed with the library service at USC to make it easier for your company to use the library?	
NON-USC SOURCES OF INFORMATION	
34. What other libraries do you use for your interlibrary loan and telephone? Rank according to your frequency of use. Indicate "1" if most used, "2" if next used. Indicate "0" if not used.	____USC ____Los Angeles Public Library ____UCLA ____Caltech ____U. C. Berkeley ____Other: _____ ____Other: _____
35. If you first choice is not USC, why do you prefer another library? Please rank your choices as in Question 34.	____More convenient ____Better service ____Better subject coverage ____Other _____ ____Other _____
36. Does your company belong to any other program which gives you library privileges at another library?	____We belong to no other service ____Stanford's Technical Info Service ____Caltech's Industrial Associates ____Other: _____
37. How does their program for library services compare with USC? Please rank your choices as follows: "1"=USC has better service; "2"=USC has the same service; "3"= USC has worse service; "0"=No Opinion.	____Interlibrary Loan ____Telephone ____Library card ____Other: _____
38. Does your company use an information service which charges for books and photo-copies delivered?	____We use no such service ____Pelner Library Service ____Information Unlimited ____Other: _____

QUESTIONS	ANSWERS
39. Does your company use any computer searching services?	____None ____Western Research Applications Center (WESRAC) ____UCLA-Center for Information Services ____Lockheed's Dialog ____System Development Corporation ____Other: _____
BACKGROUND INFORMATION	
40. What is the primary subject nature of your library?	
41. When did your company become an Industrial Associate?	____(year)
42. What is the size of your staff?	____Librarians ____Clerks ____Other: _____
43. Would you like to receive a tabulation of the responses to this questionnaire?	Yes ☐ No ☐
44. Name and address of librarian completing this questionnaire.	

45. Further Comments:

APPENDIX C

The Tabulation

1. Cover letter of May 19, 1975
2. Tabulation of all responses
3. Tabulation of Los Angeles/Orange County Responses
4. Bay Area/San Diego Responses
5. Los Angeles/Orange County Responses by Size of Library Staff

UNIVERSITY OF SOUTHERN CALIFORNIA
UNIVERSITY LIBRARY
UNIVERSITY PARK
LOS ANGELES, CALIFORNIA 90007

746-2540

May 19, 1975

Dear Industrial Associate Library:

Enclosed is the tabulation you requested when you responded to my Industrial Associate questionnaire this spring. The tabulation is divided into four parts, Parts I and IV are included here and parts II and III are available on request.

Part I is a tabulation of all responses including comments. Parts II and III subdivide the responses by geographical area; Los Angeles/Orange Counties and Bay Area/San Diego respectively.

Part IV takes the Los Angeles/Orange County responses and arranges a selection of responses by size of library staff. It points out some interesting distinctions between "large" and "small" special libraries.

I would like to thank all of you again for responding. I hope the individual contacts I have made with you will continue whenever you have a problem with which we may be able to help.

Very truly yours,

Katherine Frohmberg
Interlibrary Loans

UNIVERSITY OF SOUTHERN CALIFORNIA

EDWARD L. DOHENY, JR. MEMORIAL LIBRARY
Interlibrary Loan Department

TABULATION
INDUSTRIAL ASSOCIATE LIBRARY SURVEY
February, 1975

76 total questionnaires were sent out:

	LA/Orange Counties	Bay area/San Diego
Sent out	55	21
Responses	46	14
Usable responses	36	11

80% total response

PART I. Tabulation of All Responses

See Parts II and III for LA/Orange County and Bay area/San Diego responses respectively.

QUESTIONS	ANSWERS			
1. Are you aware that your company's USC Industrial Associate Membership entitles you to	Yes	No	N/A	No response
a) Library card with 4-week circulation privileges	24	21	2	0
b) Three day interlibrary loan turnaround.	19	25	3	0
2. Do you plan to take advantage of the USC libraries now that you know of your privileges?	40	3	1	1
3. What type of library service do you think you might use in the future?	Interlibrary Loans 41 Library card 29 Photocopies 6 No response 0			
4. Is there any specialized information about the USC Libraries we can send you which would facilitate this use?	Map of campus 24 Schedule of library hrs 27 Students library guide 24 Serials listing 7 Photocopy costs 3 No response 6			

INTERLIBRARY LOAN USE OF USC

5. Number of books (or library materials other than photocopies) borrowed from USC (per year)	Zero 14 Don't know 2 No response 12 19 libraries which order material average less than 15 transactions per year.
6. What percentage is this of your total Interlibrary Loan borrowing?	Don't know 3 Zero 13 No response 13 21 libraries use USC for an average of less than 5% of their transactions per year
7. Number of photocopies ordered from USC per year	Zero 18 Don't know 4 No response 11 14 libraries which photocopy material average less than 10 transactions per year.
8. What percentage is this of your total photocopy ordering?	Zero 17 Don't know 2 No response 15 10 libraries use USC for an average of less than 5% of their transactions per year
9. What is your opinion of the service given by USC's Interlibrary Loan service?	Excellent 5 Average 7 Poor 2 No basis for opinion 22 No response 10

	Yes	No	N/A	No response
10. Are you aware that this year USC has a Union List of Serials which is available for purchase to other institutions?	18	27	1	1
11. Do you own it?	7	33	1	6

12. How did you find out about it?	Word of mouth 3 SLA Meeting 9 Library publications 3 No response 30

	Yes	No	N/A	No response
13. Would you like to receive ordering information about it?	30	8	7	2

LIBRARY CARD USE OF USC

14. Is there a USC Library Card issued to your company library?	Yes 19 · No 24 · No response 3
15. How many cards do you have?	No response 28 No card 1 One card 14 Two cards 3
16. How many books do you check out on the USC card(s)?	No response 27 Zero 6 13 libraries which check out material average less than 10 transactions per year.
17. Whom do you send to the USC campus to check out these materials?	Member of library staff 6 Non-library messenger 0 Employee who wants books 16 No response 24 Other 3
18. How many items do you photocopy at the USC Library (as distinguished from ILL).	No response 29 Zero 13 5 libraries average less than 10 transactions per year
19. Which branches do you use when you check out books and photocopy. Please rank by indicating a "1" if most used, "2" if next used, and so on. Indicate "0" if not used.	0 · 1 · 2 · 3 · 4 · no rank Doheny 2 · 6 · 4 · 4 · 0 Science 2 · 9 · 4 · 0 · 0 · 1 Bus Ad 3 · 0 · 5 · 4 · 0 Other: 2 Law 1 · 1 VKC 2 No response 28
20. Do you know of any USC library cards issued to company employees outside of your library?	Yes 5 · No 41 · No response 0
21. How many of these individuals are there?	No response 41 No cards 2 2 or more cards 4 Comment: They are students or alum

TELEPHONE CONTACT WITH USC

22. Do you ever phone the USC libraries for reference questions and other telephone information?	Yes 23 · No 24 · No response 0
23. How often do you phone?	No response 24 1-5 times per month 21 20-30 times per month 1

24. Which branches do you find most often answer your question? Rank your choice as in #19.

	0	1	2	3	4	No rank
Doheny	1	10	3	2	0	
Science	2	6	8	1	0	2
Bus Ad	3	1	3	4	0	4
Other:						1
Law		1				
VKC					1	
No response			22			

25. What percentage of your calls are answered to your satisfaction?

No response	21
25%	1
50%	2
75%	9
100%	13

26. Are you aware that USC maintains a library information telephone number (213-746-6050) for card catalog and general library information from Monday to Saturday?

Yes	No	No response
15	13	5

27. If you were unaware of the service do you plan to use it now?

Yes	No	No response
21	7	9

28. How often do you use it?

No response	30
None	6
1-5 times per month	10
25-40 times per month	1

29. Assuming that you call other institutions for information, what percentage of your total library calls are directed to USC?

No response	15
Zero	7
1-5%	18
6-25%	5
50%	2

30. Are there any problems with the USC telephone service or any comments you would like to make?

Always found it good; very curteous service; limited geology collection

31. Would you have use for a phone answering machine which could tape your message after library hours (10 PM - 8 AM weekdays)?

Yes	No	Not sure	No response
0	37	7	3

32. Is there any other way you use the USC libraries other than library card, xerox, interlibrary loan and telephone?

No responses

33. What could be changed with the library service at USC to make it easier for your company to use the library?

Have a professional to handle our request A delivery service for loans and photo-copies; four week loans; toll free number; Publicity such as this!; not sure of parking facilities; lower prices; eliminate xerox billing

NON USC SOURCES OF INFORMATION

34. What other libraries do you use for your interlibrary loan and telephone? Rank according to your frequency of use. Indicate "1" if most used, "2" if next used, "0" if not used.

Library	0	1	2	3	4	5	6	no rank
USC	5	1	1	4	7	3	2	
Los Angeles Public	3	3	4	6	2	4	1	1
UCLA	1	13	9	4	4	1	0	1
Caltech	1	10	12	5	1	1	1	1
UC Berkeley	6	0	0	3	4	3	2	1
California State Library		1	5	1	2			1
Local academic library		1	1	4	1	1		2
Local public library		1	2		1	2		
Local special library		1	1	1	1			1
Linda Hall			2	3	1	1		1
John Crerar								1
Stanford		2	1	1				1
San Jose State		2	1					

No response given: 4

35. If your first choice is not USC, why do you prefer another library? Please rank your choices as in Question 34.

	0	1	2	3	No rank
Convenience	0	8	4	0	13
Service	2	1	5	2	3
Subject coverage	2	4	2	3	4
No response	15				

Comments: We are not in Los Angeles; Parking is a problem; We contract out to Pelner and Linderman; We were unaware of our Industrial Associate Membership.

36. Does your company belong to any other programs which give you library privileges at another library?

None	8
Stanford's Tech Info Svc	15
Caltech's Industrial Assoc	29
No response	1
Others	UC Irvine, MIT, Cal State Library Service to Industry, Corporate Member of Los Angeles Public, John Crerar

37. How does their program for library services compare with USC? Please rank your choices as follows: "1"=USC has better service; "2"=USC has same service; "3"=USC has worse service; "0"= no opinion

No response 18

	0	1	2	3	no rank
ILL	11	2	5	8	1
Phone	13	3	7	3	1
Lib card	12	1	10	2	1

38. Does your company use an information service which charges for books and photocopies delivered?	None: 12 Pelner 24 Information Unlimited 7 Barbara Linderman 6 Maryann Devine 1 No response 1
39. Does your company use any computer searching services?	None 18 WESRAC 5 UCLA Center for Info Svcs 0 Lockheed Dialog 14 System Development Corp 6 Own company service 4 Others: NTIS/DDC, NASA, Spires, Batelle No response 5

BACKGROUND INFORMATION

40. What is the primary subject nature of your library?	Wide variety of responses with emphasis on electronics, aerospace, petroleum geology and engineering
41. When did your company become an Industrial Associate?	No response 13 Don't know 17 1960-65 2 1966-70 6 1971-74 6
42. What is the size of your staff?	16 libraries have one clerk, one librarian or smaller. Remaining libraries progress to 16 librarians and 16 clerks.
43. Would you like to receive a tabulation of responses to this questionnaire?	Yes 20 No 23 No response 4

SELECTIONS FROM COMMENTS:

I would only be interested in using your service if I could not obtain what we required locally. Sometimes I have difficulty in getting international publications and reports. I would only use you if I could order by phone.

Our problem is to serve our clients in the best possible way. Usually, this means time, as much as money. A quick response - and proximity to a source - frequently determine its use.

Encouraging to see a concern for our needs

SELECTIONS FROM COMMENTS CONTINUED:

We try to keep our interlibrary loan problems away from privately endowed universities, hoping that they may retain as much of our corporate gifts as possible. We hire a service to perform this function for us at UCLA, a tax-supported university, whose charter specifically entitles industry to share in their library collection use. .... We feel that we could quickly become a burden, both to your staff and to your financial resources, and would urge you, therefore, to limit your activity and concentrate on your first responsibility, library support of the teaching programs.

We look forward to increased use of the USC Libraries through our Industrial Associates relationship.

UNIVERSITY OF SOUTHERN CALIFORNIA

EDWARD L. DOHENY, JR. MEMORIAL LIBRARY
Interlibrary Loan Department

TABULATION
INDUSTRIAL ASSOCIATE LIBRARY SURVEY
February, 1975

76 total questionnaires were sent out:

	LA/Orange Counties	Bay area/San Diego
Sent out	55	21
Responses	46	14
Usable responses	36	11

80% total response

PART II. Tabulation of LA/Orange County Responses

QUESTIONS	ANSWERS			
	Yes	No	N/A	No response
1. Are you aware that your company's USC Industrial Associate Membership entitles you to				
a) Library card with 4-week circulation privileges	22	13	1	0
b) Three-day interlibrary loan turnaround.	18	17	1	0
2. Do you plan to take advantage of the USC libraries now that you know of your privileges?	30	3	0	1
3. What type of library service do you think you might use in the future?	Interlibrary Loans 30 Library card 26 Photocopies 4 No response 0			
4. Is there any specialized information about the USC Libraries we can send you which would facilitate this use?	Map of campus 22 Schedule of Library Hours 23 Students library guide 22 Serials listing 2 Photocopy costs 1 No response 4			

INTERLIBRARY LOAN USE OF USC

5. Number of books (or library materials other than photocopies) borrowed from USC (per year)	Zero 11 Don't know 2 No response 7 16 libraries which order material average less than 15 transactions per year
6. What percentage is this of your total Interlibrary Loan borrowing?	Don't know 2 Zero 11 No response 8 18 libraries use USC for an average of less than 5% of their transactions per year.
7. Number of photocopies ordered from USC per year	Zero 15 Don't know 3 No response 7 11 libraries which photocopy material average less than 10 transactions per year.
8. What percentage is this of your total photocopy ordering?	Zero 15 Don't know 1 No response 9 8 libraries use USC for an average of less than 5% of their transactions per year.
9. What is your opinion of the service given by USC's Interlibrary Loan service?	Excellent 5 Average 5 Poor 2 No basis for opinion 21 No response 4
10. Are you aware that this year USC has a Union List of Serials which is available for purchase to other institutions?	Yes 16 / No 18 / N/A 1 / No response 1
11. Do you own it?	6 / 24 / 1 / 5
12. How did you find out about it?	Word of mouth 3 SLA Meeting 8 Library publications 3 No response 21
13. Would you like to receive ordering information about it?	Yes 19 / No 8 / N/A 7 / No response 2

LIBRARY CARD USE OF USC

14. Is there a USC Library Card issued to your company library?

Yes	No	No response
18	16	1

15. How many cards do you have?

No response	18
No card	1
One card	13
Two cards	3

16. How many books do you check out on the USC card(s)?

No response	18
Zero	4

13 libraries which check out material average less than 10 transactions per year.

17. Whom do you send to the USC campus to check out these materials?

Member of library staff	6
Non-library messenger	0
Employee who wants books	15
No response	18
Other	1

18. How many items do you photocopy at the USC Library (as distinguished from ILL).

No response	19
Zero	12

5 libraries average less than 10 transactions per year.

19. Which branches do you use when you check out books and photocopy. Please rank by indicating a "1" if most used, "2" if next used, and so on. Indicate "0" if not used.

	0	1	2	3	4	no rank
Doheny	0	6	4	4		
Science	0	9	4	0		1
Bus Ad	1		5	4		
Other:						
Law		1		1		
VKC					2	
No response		19				

20. Do you know of any USC library cards issued to company employees outside of your library?

Yes	No	No response
5	31	0

21. How many of these individuals are there?

No response	31
No cards	1
2 or more cards	4

Comment: They are students or alum

TELEPHONE CONTACT WITH USC

22. Do you ever phone the USC libraries for reference questions and other telephone information?

Yes	No	No response
22	14	0

23. How often do you phone?

No response	15
1-5 times per month	20
20-30 times per month	1

24. Which branches do you find most often answer your question? Rank your choice as in #19.

	0	1	2	3	4	No rank
Doheny	1	9	3	2		
Science	1	6	8	1		2
Bus Ad	2	1	3	4		4
Other:						1
Law		1				
VKC					1	
No response			12			

25. What percentage of your calls are answered to your satisfaction?

No response	11
25%	1
50%	2
75%	9
100%	13

26. Are you aware that USC maintains a library information telephone number (213-746-6050) for card catalog and general library information from Monday to Saturday?

Yes	No	No response
14	6	2

27. If you were unaware of the service do you plan to use it now?

Yes	No	No response
21	6	9

28. How often do you use it?

No response	21
None	4
1-5 times per month	10
25-40 times per month	1

29. Assuming that you call other institutions for information, what percentage of your total library calls are directed to USC?

No response	8
Zero	5
1-5%	16
6-25%	5
50%	2

30. Are there any problems with the USC telephone service or any comments you would like to make?

Always found it good; very curteous service; limited geology collection

31. Would you have use for a phone answering machine which could tape your message after library hours (10 PM - 8 AM weekdays)?

Yes	No	Not sure	No response
0	30	5	1

32. Is there any other way you use the USC libraries other than library card, xerox, interlibrary loan and telephone?

No responses

33. What could be changed with the library service at USC to make it easier for your company to use the library?

Have a professional to handle our requests; A delivery service for loans and photocopies; four week loans; toll free number; Publicity such as this! Not sure of parking facilities; lower prices; eliminate xerox billing

NON USC SOURCES OF INFORMATION

34. What other libraries do you use for your interlibrary loan and telephone? Rank according to your frequency of use. Indicate "1" if most used, "2" if next used, "0" if not used.

Library	0	1	2	3	4	5	6	no rank
USC	4	1	1	3	6	3	2	
Los Angeles Public	3	3	4	5	2	3	1	1
UCLA	1	13	9	3	3			1
Caltech	1	8	12	5		1	1	1
UC Berkeley	6				4	3	2	1
California State Library		1	1	1	2			1
Local academic library		1	1	4	1			1
Local public library		1	1		1	1		
Local special library		1	1	1	1	2		
Linda Hall			2	3	1			1
John Crerar								1
Stanford						1		
San Jose State								

No response given: 2

35. If your first choice is not USC, why do you prefer another library? Please rank your choices as in Question 34.

	0	1	2	3	No rank
Convenience	0	6	4	0	9
Service	0	1	5	2	3
Subject coverage	0	4	2	3	4

No response 11

Comments: Parking is unavailable; We contract out to Pelner and Linderman; We were unaware of Industrial Associate membership

36. Does your company belong to any other programs which give you library privileges at another library?

None	7
Stanford's Tech Info Svc	7
Caltech's Industrial Assoc	25
No response	1

Others UC Irvine, MIT, Corporate member of Los Angeles Public, John Crerar.

37. How does their program for library services compare with USC? Please rank your choices as follows: "1"=USC has better service; "2"=USC has same service; "3"=USC has worse service; "0"= no opinion

No response 11

	0	1	2	3	no rank
ILL	9	1	4	8	1
Phone	11	3	5	3	1
Lib card	10	1	8	2	1

38. Does your company use an information service which charges for books and photocopies delivered?	None: 8 Pelner 22 Information Unlimited 3 Barbara Linderman 6 Maryann Devine 1 No response 0
39. Does your company use any computer searching services?	None 17 WESRAC 5 UCLA Center for Info Svcs 0 Lockheed Dialog 8 System Development Corp 4 Own company service 3 Others: NTIS/DDC, NASA, Batelle No response 3

BACKGROUND INFORMATION

40. What is the primary subject nature of your library?	Wide variety of responses with emphasis on electronics, aerospace, petroleum geology and engineering
41. When did your company become an Industrial Associate?	No response 6 Don't know 17 1960-65 2 1966-70 5 1971-74 5
42. What is the size of your staff?	13 libraries have one clerk, one librarian or smaller. Remaining libraries progress to 16 librarians and 16 clerks.
43. Would you like to receive a tabulation of responses to this questionnaire?	Yes 19 No 15 No response 2

UNIVERSITY OF SOUTHERN CALIFORNIA

EDWARD L. DOHENY, JR. MEMORIAL LIBRARY
Interlibrary Loan Department

TABULATION
INDUSTRIAL ASSOCIATE LIBRARY SURVEY
February, 1975

76 total questionnaires were sent out:

	LA/Orange Counties	Bay area/San Diego
Sent out	55	21
Responses	46	14
Usable responses	36	11

80% total response

PART III. Bay area/San Diego Responses

QUESTIONS	ANSWERS			
	Yes	No	N/A	No response
1. Are you aware that your company's USC Industrial Associate Membership entitles you to				
a) Library card with 4-week circulation privileges	2	8	1	0
b) Three day interlibrary loan turnaround.	1	8	2	0
2. Do you plan to take advantage of the USC libraries now that you know of your privileges?	10	0	1	0

QUESTIONS	ANSWERS	
3. What type of library service do you think you might use in the future?	Interlibrary Loans	11
	Library card	3
	Photocopies	2
	No response	0
4. Is there any specialized information about the USC Libraries we can send you which would facilitate this use?	Map of Campus	2
	Schedule of Library hours	4
	Students library guide	2
	Serials listing	5
	Photocopy costs	2
	No response	2

INTERLIBRARY LOAN USE OF USC

5. Number of books (or library materials other than photocopies) borrowed from USC (per year)	Zero 3 Don't know 0 No response 5 3 libraries which order material average less than 15 transactions per year.
6. What percentage is this of your total Interlibrary Loan borrowing?	Don't know 1 Zero 2 No response 5 3 libraries use USC for an average of less than 5% of their transactions per year.
7. Number of photocopies ordered from USC per year	Zero 3 Don't know 1 No response 4 3 libraries which photocopy material average less than 10 transactions per year
8. What percentage is this of your total photocopy ordering?	Zero 2 Don't know 1 No response 6 2 libraries use USC for an average of less than 5% of their transactions per year.
9. What is your opinion of the service given by USC's Interlibrary Loan service?	Excellent 0 Average 2 Poor 0 No basis for opinion 1 No response 6
10. Are you aware that this year USC has a Union List of Serials which is available for purchase to other institutions?	Yes 2 — No 9 — N/A 0 — No response 0
11. Do you own it?	Yes 1 — No 9 — N/A 0 — No response 1
12. How did you find out about it?	Word of mouth 0 SLA Meeting 1 Library publications 0 No response 9
13. Would you like to receive ordering information about it?	Yes 11 — No 0 — N/A 0 — No response 0

LIBRARY CARD USE OF USC

14. Is there a USC Library Card issued to your company library?	Yes: 1 — No: 8 — No response: 2
15. How many cards do you have?	No response: 10 No card: 0 One card: 1 Two cards: 0
16. How many books do you check out on the USC card(s)?	No response: 9 Zero: 2
17. Whom do you send to the USC campus to check out these materials?	Member of library staff: 0 Non-library messenger: 0 Employee who wants books: 1 No response: 8 Other: 2
18. How many items do you photocopy at the USC Library (as distinguished from ILL).	No response: 10 Zero: 1
19. Which branches do you use when you check out books and photocopy. Please rank by indicating a "1" if most used, "2" if next used, and so on. Indicate "0" if not used.	0 1 2 3 4 no rank Doheny 2 Science 2 Bus Ad 2 Other: 2 Law VKC No response 9
20. Do you know of any USC library cards issued to company employees outside of your library?	Yes: 0 — No: 11 — No response: 0
21. How many of these individuals are there?	No response: 10 No cards: 1 2 or more cards: 0 Comment: They are students or alumn

TELEPHONE CONTACT WITH USC

22. Do you ever phone the USC libraries for reference questions and other telephone information?	Yes: 1 — No: 10 — No response: 0
23. How often do you phone?	No response: 9 1-5 times per month: 1 20-30 times per month

24. Which branches do you find most often answer your question? Rank your choice as in #19.	0 1 2 3 4 No rank Doheny 1 Science 1 Bus Ad 1 Other: Law VKC No response 10
25. What percentage of your calls are answered to your satisfaction?	No response 10 25% 50% 75% 100%
26. Are you aware that USC maintains a library information telephone number (213-746-6050) for card catalog and general library information from Monday to Saturday?	Yes 1 No 7 No response 3
27. If you were unaware of the service do you plan to use it now?	Yes 10 No 1 No response 0 Comment: Distance is a problem
28. How often do you use it?	No response 9 None 2 1-5 times per month 25-40 times per month
29. Assuming that you call other institutions for information, what percentage of your total library calls are directed to USC?	No response 7 Zero 2 1-5% 2 6-25% 50%
30. Are there any problems with the USC telephone service or any comments you would like to make?	No responses
31. Would you have use for a phone answering machine which could tape your message after library hours (10 PM - 8 AM weekdays)?	Yes 0 No 7 Not sure 2 No response 2
32. Is there any other way you use the USC libraries other than library card, xerox, interlibrary loan and telephone?	no responses
33. What could be changed with the library service at USC to make it easier for your company to use the library?	Eliminate xerox billing

NON USC SOURCES OF INFORMATION

34. What other libraries do you use for your interlibrary loan and telephone? Rank according to your frequency of use. Indicate "1" if most used, "2" if next used, "0" if not used.

Library	0	1	2	3	4	5	6	no rank
USC	1			1	1			
Los Angeles Public				1		1		
UCLA				1	1	1		
Caltech		2			1			
UC Berkeley				3				
California State Library			4					
Local academic library								1
Local public library			1					
Local special library								1
Linda Hall								
John Crerar								1
Stanford		2	1	1				
San Jose State		2	1					

No response given: 2

35. If your first choice is not USC, why do you prefer another library? Please rank your choices as in Question 34.

	0	1	2	3	No rank
Convenience	0	2	0	0	4
Service	2	0	0	0	0
Subject coverage	2	0	0	0	0

No response 4

Comments: We are not in Los Angeles, We were unaware of our Industrial Associate membership

36. Does your company belong to any other programs which give you library privileges at another library?

None	1
Stanford's Tech Info Svc	8
Caltech's Industrial Assoc	4
No response	0
Others	MIT, Crerar, California State Library Service to Industry

37. How does their program for library services compare with USC? Please rank your choices as follows: "1"=USC has better service; "2"=USC has same service; "3"=USC has worse service; "0"= no opinion

No response 7

	0	1	2	3	no rank
ILL	2	1	1	0	
Phone	2	0	2	0	
Lib card	2	0	2	0	

38. Does your company use an information service which charges for books and photocopies delivered?	None: 4 Pelner 2 Information Unlimited 4 Barbara Linderman 0 Maryann Devine 0 No response 1
39. Does your company use any computer searching services?	None 1 WESRAC 0 UCLA Center for Info Svcs 0 Lockheed Dialog 6 System Development Corp 2 Own company service 1 Others: NTIS/DDC, NASA, Spires. No response 2

BACKGROUND INFORMATION

40. What is the primary subject nature of your library?	Wide variety of responses with emphasis on electronics, aerospace, petroleum geology and engineering
41. When did your company become an Industrial Associate?	No response 7 Don't know 0 1960-65 0 1966-70 1 1971-74 1
42. What is the size of your staff?	3 libraries have one clerk, one librarian or smaller. Remaining libraries progress to 6 librarians and 7 clerks.
43. Would you like to receive a tabulation of responses to this questionnaire?	Yes 1 No 8 No response 2

UNIVERSITY OF SOUTHERN CALIFORNIA

EDWARD L. DOHENY, JR. MEMORIAL LIBRARY
Interlibrary Loan Department

TABULATION
INDUSTRIAL ASSOCIATE LIBRARY SURVEY
February, 1975

PART IV. Los Angeles/Orange County Responses by size of staff

The attached table arranges the Los Angeles/Orange County responses by size of staff. With this arrangement, the libraries were easily divided into 18 "large" libraries with staffs of four or more and 18 "small" libraries with staffs of three or less. It compares the following selection of responses from the questionnaire:

(1) Was the company aware of the library card and interlibrary loan aspect of the Industrial Associate membership. An 'x' in either column indicates they were aware. 83% of the large libraries were aware of either one or both services while only 50% of the small libraries were aware.

(5) and (7) Number of books and photocopies ordered through interlibrary loan per year. NR=no response

(11) and (13) "Have" indicates the respondant owns the USC Union List of Serials and "want" indicates they wanted ordering information about the list. 90% of the large libraries had or wanted the printout as opposed to 55% of the small libraries.

(15) How many (if any) USC library cards issued to the company library.

(34)Which libraries are used most for interlibrary loan and telephone. UCLA and CIT are the overwhelmingly used libraries in the Los Angeles area for both large and small libraries. 90% of the large libraries indicated UCLA and/or CIT as first or second choice and 78% of the small libraries indicated UCLA and/or CIT.

(35) Convenience seems to be the most important factor in choosing one library over another. 50% of the large libraries and 33% of the small libraries indicated that convenience was the major factor in choosing one library over another. Three libraries did indicate they used UCLA most because they had a commercial service, Pelner or Linderman, who could obtain fast and efficient material for them.

(36) Membership in another program which provides library privileges. 95% of the large libraries and 45% of the small libraries belonged to Caltech's Industrial Associate program. One-third of the Bay Area respondants also belonged to Caltech's program.

(38) Does the company use an information and photocopy service which charges for books and photocopies delivered. Pelner=Bonnie Pelner; I.U.=Information Unlimited; Lind=Barbara Linderman. The large libraries tend to supplement their basic charging service with a second service -- one-third of the large libraries used two charging services. Pelner is by far the most used service, both in large and small libraries.

(39) Does the company use any computer searching services? 30% of the large libraries used no services as opposed to 80% of the small.

(42) Size of staff in librarians and library assistants. Any response on the questionnaire in the "other" category was grouped as a library assistant.

(43) Did the library wish to receive a tabulation of the responses. 70% of the large libraries wanted a copy of the tabulation as opposed to 33% of the small.

PART IV LA/ORANGE COUNTY RESPONSES BY SIZE OF STAFF

(1)		(5&7)		(11&13)		(15)	(34)		(35)	(36)	(38)	(39)	(42)		(47
rd	ILL	# Bks	# Phs	Serials Have	Serials Want	Libr Card	Most Used	2nd used	Why	Other I.A. Memberships	Charging Services	Searching Services	Libr. Libs	Libr. Assts	Tab
x	x	few	few	x		1	UCLA	CIT	Conven.	CIT & MIT	Pel&Lind	DDC,NASA	16	16	x
	x	50	0		x	0	UCLA	CIT	Covg.	CIT	Pel&I.U.	WESRAC	11	22	x
x	x	?	?		x	1	UCLA	Spec Libs	Service	CIT	Pel&Lind	WESR,Lockh	10	5	x
x	x	10	10		x	1	UCLA	Linda Hall	Devine	CIT	M. Devine	SDC,Lockh	6	22	x
		20	50		x	0	LAPL	UCLA	Conven	CIT&Stanf	I.U.&Lind	SDC,Lockh	5	5	x
x	x	1	2			2	CIT	UCLA	Conven	CIT	Pelner	SDC,Lockh	4	8	
x	x	NR	NR		x	2	UCLA	CIT	Conven	CIT	Pelner	Lockheed	4	7	x
		0	0	x		0	LAPL	UCLA	NR	CIT	None	None	4	6	
x		0	0		x	2	CIT	LAPL	NR	CIT	Pelner	WESRAC	4	1	x
x	x	4	8	x		1	UCLA	CIT	Service	CIT	Pel&Lind	DDC	3	7	x
		4	10		x	0	Br Libs	CIT	Conven	CIT	Pelner	DDC	3	6	
x	x	150	360			1	USC	LAPL	NR	CIT	Pelner	None	3	4	x
x		NR	NR		x	1	CIT	Cal Pomona	Conven	CIT	None	None	2	3	
x	x	15	240		x	1	UCLA	CIT	Conven	CIT	Pelner	WESRAC	2	2	x
x		10	o		x	0	CIT	UCLA	Conven	CIT	Pel&I.U.	Orbit,Dial	2	2	x
x		5	10		x	1	CIT	Linda Hall	Covg	CIT	Pelner	SDC	1	7	x
x	x	10	10	x		0	Local PL	Local PL	Conven	CIT	Linderman	None	1	4	x
x	x	10	10	x		1	LAPL	UCLA	Covg	None	Pelner	None	1	4	
		0	0		x	0	Irvine	CIT	Conven	CIT&Irvine	Pelner	None	2	0	x
x	x	few	few		x	1	UCLA	CIT	Conven	CIT	In-house	None	1	2	
x	x	0	0		x	1	UCLA	CIT	Conven	None	None	DDC	1	2	
		0	0			0	NR	NR	NR	NR	None	None	1	1	
x	x	?	?			1	St.Libr.	UCLA	Covg	CIT	Pelner	Dialog	1	1	
		0	5		x	0	CIT	UCLA	NR	CIT	Pelner	WESR,DDC	1	1	
		0	0		x	0	UCLA	LAPL	NR	None	Pelner	None	1	1	x
		0	0	x		0	UCLA	USC	Covg	LAPL	Pelner	None	1	1	x
x		10	0		x	1	UCLA	NR	Pelner	None	Pelner	None	1	0	x
	x	0	0			0	CIT	State Lib.	Conven.	CIT&Stanford	Pelner	None	1	0	x
x	x	0	0		x	0	CIT	UCLA	Conven.	CIT	Pelner	Lockheed	1	0	
x	x	0	2			0	UCLA	CIT	Covg	Stanford	None	None	1	0	x
		0	0			0	UCLA	CIT	Pelner	None	Pelner	None	1	0	
x	x	?	?			0	None	None	NR	None	None	None	1	0	
x	x	10	0			1	Cal St Northridge		Conven	Cal St Nor.	None	None	1	0	
		0	0		x	0	CIT	LAPL	NR	CIT	None	None	0	2	
		?	?		x	0	UCLA	CIT	NR	CIT	Linderman	None	0	2	
		0	0			0	NR	NR	NR	None	None	None	0	1	

APPENDIX D

The Guidelines

UNIVERSITY OF SOUTHERN CALIFORNIA

Edward L. Doheny, Jr. Memorial Library

Guidelines for use of the USC Libraries by Industrial Associate Members

Included in your membershipin USC School of Engineering's Industrial Associate program is free use of a library card at the University Libraries. Although no guarantee of rush Interlibrary Loan service can be made, we attempt to give Industrial Associate requests priority.

LIBRARY CARD

To obtain a library card for use of your employees, please contact the Industrial Associate Office (746-2502) or send your employee to the Doheny Library with a letter indicating he is eligible for a library card. Your company may have as many cards as you wish, however, we request that each card be made out to a specific individual within your employ who must be responsible for any charges made on the card.

Library cards must be updated each Fall, Spring and Summer Session. This may be done by mail or in person by presenting the card and a letter stating that the person to whom the card is issued will be using the card in the course of his work for the company. For any questions regarding library card use, phone Dale Jarvis, Circulation Department, 746-2924.

Most materials may be borrowed for four weeks. Renewals may be made in person or by telephone at the branch library from which the loan was made, provided the item has not been requested by another borrower. Fines accrue at the rate of ten cents per day to a maximum fine of $10.00.

We are unable to loan periodicals due to their heavy use; however, each library has a coin operated, five cents per page copy machine available for quick photocopying of needed articles. Articles may also be ordered by mail through Interlibrary Loan photocopy services (see below).

INTERLIBRARY LOANS

Interlibrary Loans provides a means by which loans of books and purchase of copies may be made by mail between libraries of two institutions. We are unfortunately unable to accept orders by telephone, however, we will accept questions about status of requests and renewals by phone. USC-ILL has a Western Union TWX machine (910-321-3912).

Loans are made for two weeks from the date the book is received at your library. Renewals are made by phoning USC-ILL (746-2540) if the materials have not been requested by another borrower. All loans are insured for a minimum of $50.00 and we request that you refund our postage by stamp or coin.

USC Interlibrary Loan follows the procedures described in the National Interlibrary Loan Code. One exception is that we will lend in-print materials if it is not under heavy demand by our borrowers.

USC-ILL has maintained an average 3-day turnaround on all requests except photocopy. However, if you will indicate your Industrial Associate membership on the top of your borrowing request, we will attempt to give it priority.

Please direct your interlibrary loan requests to this address:

Interlibrary Loans
University of Southern California Library
University Park
Los Angeles, Calif. 90007

Directing your request to the branch library where the book is shelved will only delay your request. For any questions regarding interlibrary loan, contact Christine Gladish at 746-2540.

PHOTODUPLICATION SERVICE

After some initial searching, all mail requests for copying received at Interlibrary Loans are forwarded to the Photoduplication Service for further processing. Photoduplication Service is unable to accept phone orders but will accept orders by TWX. Requests for copying must specifically state that xerox or microfilm is desired. Charges on mail orders for photocopies are as follows:

Minimum charge per order	$2.50
Minimum charge per volume (up to 3 prints)	1.00
4-10 prints from same volume, each	.25
10- prints from same volume, each	.15
Packaging and mailing fee	
Orders under $10 minimum	.25
Orders $10 and over, minimum	1.00

Copies will be provided for as many items, on a given order, as are immediately available in the Library. These copies will be considered as one order and the minimum charge applied accordingly. Copies of the remaining items will be provided, as separate orders, as the materials become available.

For any questions regarding Photoduplication, please contact Dr. Francis Spreitzer, 746-6077.

INFORMATION DESK

USC Libraries maintain a card catalog information number (746-6050) which will check our holdings by telephone up to three titles per call. Verification of ownership makes no guarantee that the item is available for loan; it may be checked out, on reserve, etc.

UNION LIST OF SERIALS

USC Libraries now have available a one-volume computer produced listing of all our serial holdings--including LAW, Medical, Hancock, Gerontology and branches of the main system. This listing is produced twice per year and is available for $15 per issue. Send your purchase order to: Ms. Linda Crismond, Head, Technical Services,University of Southern California LIbrary, University Park, Los Angeles, Calif. 90007.

PARKING

Industrial Associate members may take advantage of the regular 75¢ parking facilities.

OTHER INFORMATION AVAILABLE ABOUT THE USC LIBRARIES

1. Complete Interlibrary Loans policy, including dissertation lending policy.
2. Library Photoduplication policy, including micro-reproduction rates.
3. Two-page listing of libraries, their hours and map of their locations on the USC campus.
4. USC Students Library Guide giving descriptions of special collections, branch holdings and instructions for use of card catalog and other library tools.
5. "Welcome to the Seaver Library" giving circulation policies for various types of materials and locations of various tools in the Seaver Library.

APPENDIX E

BIBLIOGRAPHY

APPENDIX E

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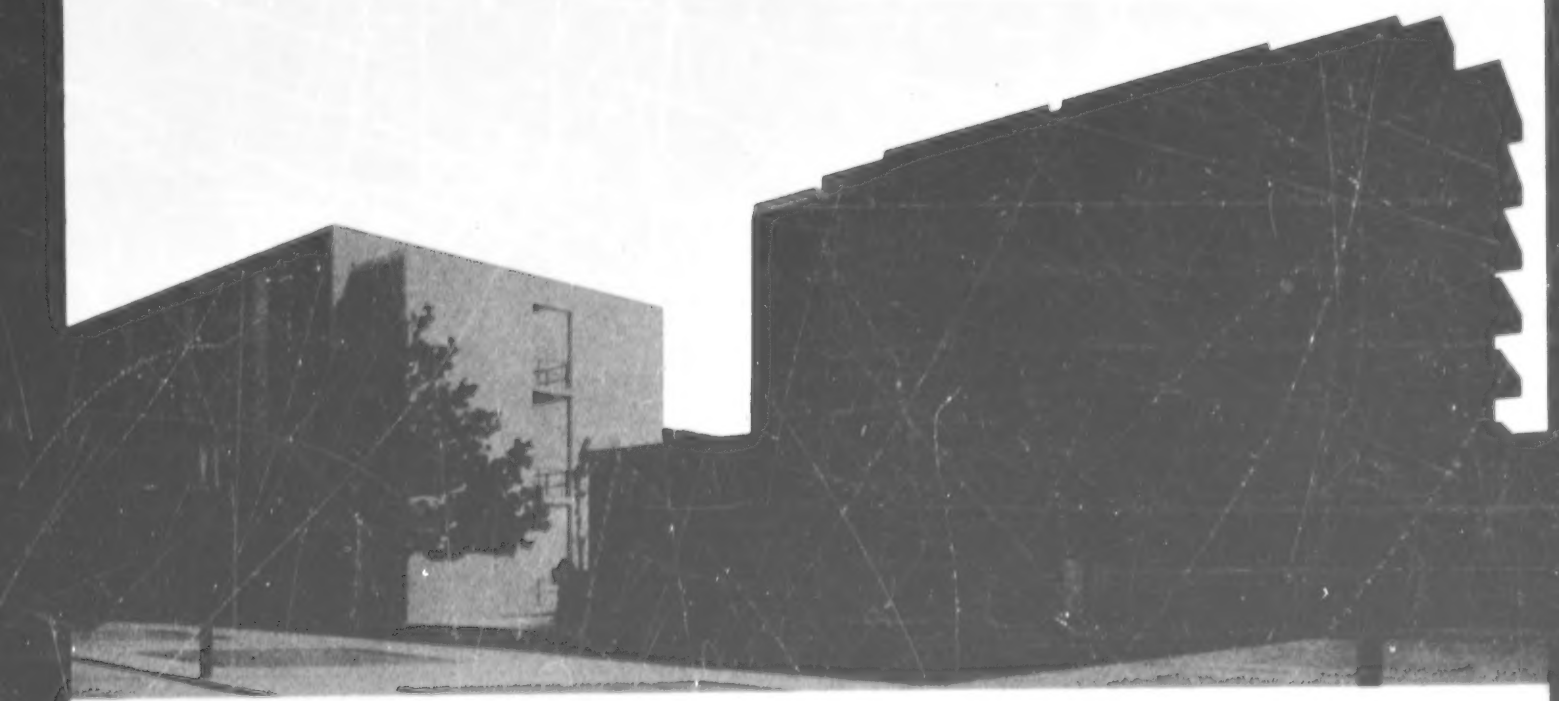
APPENDIX F

Industrial Associate Brochure

AN INVITATION
from the
UNIVERSITY OF SOUTHERN CALIFORNIA
to become an
INDUSTRIAL ASSOCIATE
of the
SCHOOL OF ENGINEERING



PETROLEUM & CHEMICAL ENGINEERING BUILDING

LOW-DENSITY WIND TUNNEL

FRANK R. SEAVER SCIENCE CENTER

76

A MUTUALLY REWARDING RELATIONSHIP

The University of Southern California and the School of Engineering are both proponents and beneficiaries of the private enterprise system. Independent higher education could not survive without the mutually rewarding relationships which exist between institutions of advanced learning and business and industry. Conversely, industry and the business community are principal beneficiaries of a university's educational and research programs.

The Industrial Associate Program of the USC School of Engineering is an example of a cooperative relationship between an independent university and private enterprise.

Industrial Associates are business organizations whose activities encompass science and engineering disciplines. Their participation in the program helps to support the development of the largest private engineering school in Southern California in its efforts to serve industry through education and research. In return, members receive benefits obtainable only through association with an institution of advanced engineering education.

TO FURTHER COMMON GOALS IN ENGINEERING EDUCATION

The Industrial Associate Program offers technologically-oriented companies special opportunities for interaction and cooperation with the School of Engineering in furthering common goals in engineering education.

Each Industrial Associate allocates $5,000, $10,000, or more, annually for unrestricted support of the School's teaching, research, and service programs. This support is an investment in the development of future engineering man power and academic research programs essential to the continued growth of private industry.

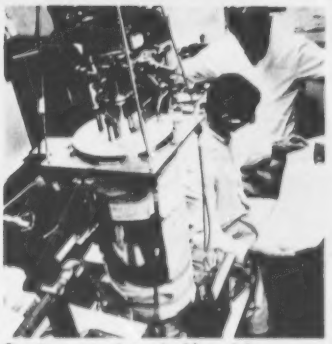
Participation in the Program also establishes a formal channel of communication between the company and the University. The Industrial Associate office serves as the focal point for liaison and the exchange of technical information, contact with the faculty, and other benefits available to Industrial Associates.

Membership in the Program is an informal arrangement, not a permanent commitment, and may be reviewed annually by each Industrial Associate.

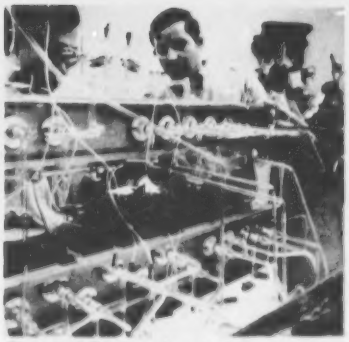
BENEFITS AVAILABLE TO MEMBERS

The Industrial Associate Program at USC is dedicated to the development of mutually beneficial relationships between participating companies and the School of Engineering. Through membership in the Program each company, as well as all divisions of multidivisional corporations, are entitled to the following benefits:

- Privileged access to members of the faculty for technical discussions and informal consultation on problems of mutual interest.
- Reports on research activities in the School of Engineering and copies of technical articles and presentations by the faculty. Publications are distributed to members monthly by the Industrial Associate Office.
- Special seminars and research conferences to review progress on engineering and scientific programs of interest to industry.
- Access to specialized research facilities in the School for conducting tests and investigations.
- Assistance in recruiting engineering and science graduates. A compendium of biographical data on graduate students is furnished to members each year, and special arrangements are provided Industrial Associates for interviewing candidates.
- Full privileges for use of the University's extensive libraries.
- Advance announcement of new academic programs and special courses for re-training and up-dating engineers in industry.
- Use of the School's auditorium and conference facilities for special company meetings or activities.
- Cooperation in developing other avenues for interaction in each member's particular fields of interest and activity — for example, joint research efforts.

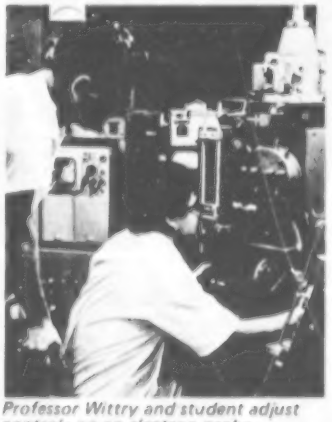


Graduate students in Materials Science analyze spectrometer data for photo-threshold measurement of a Schottky diode.



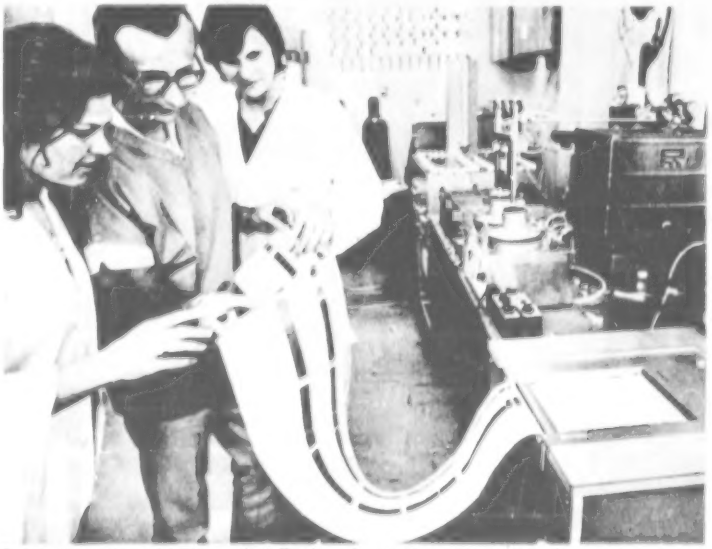
Chemical Engineering students investigating the effectiveness of oxide catalysts for air pollution abatement.

Civil Engineering laboratory modeling of air or water flow past a barrier to investigate the effect of vertical stratification.



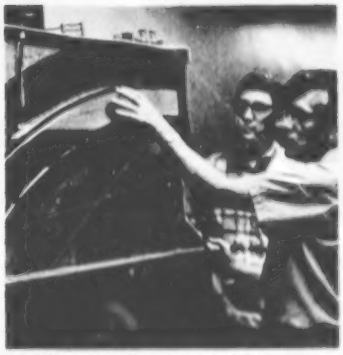
Professor Wittry and student adjust controls on an electron probe microanalyzer which uses a focused electron beam to excite solid specimens for x-ray microanalysis or studies of cathodoluminescence.

Professor and graduate students examining electron gun assembly in electron-beam vacuum evaporater used for deposition of thin films.



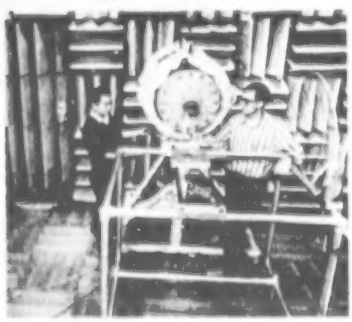
Graduate students in Biomedical Engineering analyze chart recording during investigations of renal function using artificial kidney.

Professor Faust and graduate student discuss electrode assembly and mirror alignment of a large water-vapor far-infrared laser.



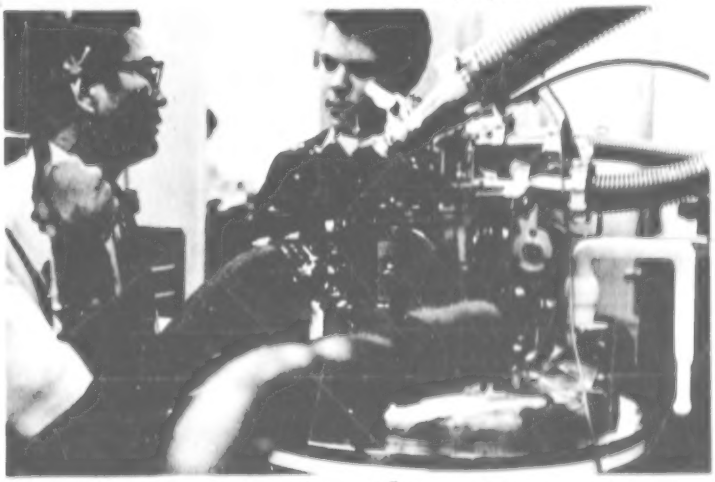
Professor Handy using model to explain oil reservoir characteristics.

Professor Bowerman and Environmental Engineering staff discuss selection of sampling stations for determining water pollution levels at Marina del Rey.



Graduate students in Aerospace Engineering align direction microphone system in anechoic chamber for investigations in jet noise reduction.

Professor Pratt mounts color photograph in a facsimile unit which digitizes color images for image processing coding operations, such as space relay digital communications.



Professor Kim explains operation of large He^3 cryostat for studying properties of superconducting materials at temperatures below 1°K.

BENEFITS AVAILABLE TO MEMBERS

PRIVILEGED ACCESS TO THE FACULTY AND INFORMAL CONSULTATION

Industrial Associates have privileged access to USC faculty to review recent developments in technical areas in which the company is active or contemplating activity, and for informal consultation on specific problems.

Meetings may be either on-campus or at the company's facilities, and members may take advantage of this benefit by scheduling in-plant group meetings or seminars for their engineering and science staff.

Generally, Industrial Associates are interested in discussions with engineering and science faculty. However, in special circumstances arrangements can be made for meetings with any faculty members of the University.

Privileged access to the faculty under the Industrial Associate relationship is distinguished from long-term formal consultation which is arranged between companies and individual faculty members.

PUBLICATIONS BY MEMBERS OF THE FACULTY

Copies of technical publications by members of the faculty are available to Industrial Associates. These include detailed reports on research programs in the School, preprints and reprints of technical articles, and presentations at science and engineering meetings and symposia.

The Industrial Associate Office distributes such publications monthly to all interested personnel in each company. Addressees designate in advance technical areas of particular interest and receive only publications in these areas. However, for their information, all addressees are notified of the availability of all new publications.

SEMINARS AND RESEARCH REVIEWS

Industrial Associates are notified of the numerous seminars in science and engineering scheduled on-campus each month. The seminar series encompasses a broad range of technological areas, and topics are selected to serve the interests of a wide segment of the industrial and academic communities. Industrial Associates are invited to suggest subjects directly related to their specific problems or fields of activity.

Members are also invited to have representatives attend special seminars and periodic reviews of progress on various research programs in the School of Engineering.

USE OF THE SCHOOL'S LABORATORY EQUIPMENT & FACILITIES

Companies occasionally require specialized equipment or facilities for conducting tests and investigations. Arrangements may be made through the Industrial Associate Office for members to use such equipment and facilities in the laboratories of the School, at minimal cost, at times when they are not being utilized by students and faculty.

Among the facilities available are the low-speed wind tunnel and anechoic chamber in Aerospace Engineering; hypersonic range in Mechanical Engineering; stratified fluid flow and strength of materials laboratories in Civil Engineering; high-pressure compaction, and mechanical and physical properties test equipment in Chemical & Petroleum Engineering; and numerous specialized laboratories in Electrical Engineering and Materials Science for studies in X-ray diffraction, spectroscopy, light scattering, microelectronics, electron microscopy, magnetic resonance, crystal growth, electron microprobe analysis, high-power lasers, computer image processing, and low-temperature properties of materials.

ASSISTANCE IN RECRUITING GRADUATES

The Industrial Associate Office, in cooperation with the University Career Planning & Placement Center, assists member-companies in recruiting engineering and science graduates, and provides separate interview facilities within the School of Engineering.

In addition, designated management personnel in each company are furnished an annual compendium of biographical data on graduate students to assist in selecting for consideration those with qualifications and interests suitable for future positions with the company.

The Industrial Associate Office is also available to assist companies in filling other manpower needs such as requirements for engineers experienced in specific technical areas.

LIBRARY PRIVILEGES

Industrial Associates are entitled to full privileges at the University's extensive libraries including Seaver Science-Engineering, Business Administration, and Doheny Memorial. A Library Courtesy Card is furnished to the company or division technical librarian, or other authorized personnel, and may be used for inter-library transfers or loaned to company employees for use while visiting the campus.

ANNOUNCEMENTS OF NEW ACADEMIC PROGRAMS AND SPECIAL COURSES

Designated technical and training personnel in each member-company also receive announcements of new academic programs, intensive short courses for up-dating practicing engineers, and a variety of continuing education programs.

USE OF UNIVERSITY CONFERENCE FACILITIES

The auditorium and conference facilities in the School of Engineering and at other locations on the campus are available to Industrial Associates for special company meetings and activities. Companies often utilize such facilities when it is desirable to schedule the event away from regular plant or office facilities.

OTHER OPPORTUNITIES FOR INTERACTION – JOINT RESEARCH EFFORTS

The Industrial Associate Office is available to assist member-companies in developing other avenues for interaction with the School. These vary depending upon individual company interests and areas of technical activity.

An example is the establishment of cooperative research programs. There has been increasing interest by industry in sponsoring basic research at university laboratories. An educational institution can generally conduct programs in specialized technical areas at substantially lower cost than industry.

The School of Engineering offers excellent opportunities for such cooperative efforts. It has the investigative manpower and specialized instrumentation required for research in a broad range of technological areas. Programs may be concerned with the solution of existing engineering problems, product improvement, or the development of new products or processes. The Industrial Associate Office assists member-companies in developing appropriate programs.

ENGINEERING AT THE UNIVERSITY OF SOUTHERN CALIFORNIA

Engineering education has been offered at the University of Southern California since 1906, and of over 123,000 graduates of the University, approximately 11,000 have been awarded degrees in engineering.

Situated in one of the largest scientific and industrial communities in the world, the School of Engineering stresses excellence in engineering education and research, and offers students the broad comprehensive training essential to modern technologies. The School is fully accredited in all disciplines by the Engineers' Council for Professional Development, and offers both undergraduate (B.S.) and graduate (M.S., Engineer, and Ph.D.) degrees in the following disciplines:

- Aerospace Engineering
- Chemical Engineering
- Civil Engineering
- Electrical Engineering
- Mechanical Engineering
- Petroleum Engineering
- Industrial and Systems Engineering

and graduate degree programs in:

- Applied Mechanics
- Biomedical Engineering
- Computer Science
- Materials Science
- Ocean Engineering
- Operations Research
- Environmental Engineering

The past decade has been a period of major achievement in the School of Engineering. Full-time faculty has increased from 44 in 1960 to over 125, all active in research and many eminent in their fields. Funded research has expanded tenfold to over $5 million annually, and encompasses essentially all aspects of modern engineering science.

Academic programs have been expanded and new curricula added to keep students abreast of new developments in science and engineering. Graduate enrollment has increased 25%, and the number of candidates in the Doctoral Program has grown from 10 in 1960 to over 300. Present enrollment in all disciplines is approximately 2400, with two-thirds of the students pursuing graduate study. The School annually confers approximately 50 Ph.D., 25 Engineer, 400 M.S., and 150 B.S. degrees.

There has been a major expansion in physical facilities with the addition of Olin Hall of Engineering in 1963 and Vivian Hall of Engineering and Materials Science in 1966, both gifts of the Olin Foundation. A third major new structure, the Frank R. Seaver Science Center, was dedicated in 1970. The Center, made possible through the generosity of Mrs. Frank R. Seaver, consists of a 3-story centralized Science, Engineering Library and a 7-story laboratory complex for inter disciplinary research in the solid state sciences. A fourth new facility, the Charles Lee Powell Hall of Information Sciences and Systems Engineering, is scheduled for completion in 1972.

RECENT DEVELOPMENTS IN THE SCHOOL OF ENGINEERING

1963 Award of a continuing Tri-Service Grant by the Department of Defense for basic research in electronics. USC is one of nine schools in the nation participating in this program today.

1965 Participation in the $4.7 million award to USC by the National Science Foundation for creation of a "center of excellence" in science and engineering.

Establishment of the Department of Materials Science, and two new graduate program options:
Biomedical Engineering in the Department of Electrical Engineering, and Ocean Engineering in the Department of Aerospace Engineering.

1968 Establishment of a graduate program in Computer Science, in cooperation with the Department of Mathematics, offering the M.S. and Ph.D. degrees in Computer Science.

Creation of the Lloyd Freeman Hunt Chair in Electric Power Engineering, the first Chair in Electric Power to be established at a western university.

Award of a $4 million five-year grant from the National Institutes of Health for research in biomedical engineering and biomathematics.

1969 Participation in the $3 million extension of the 1965 National Science Foundation Award for further development of "centers of excellence" in science and engineering.

Election of USC as the 48th member of the prestigious Association of American Universities and affiliated Association of Graduate Schools.

1970 Establishment of the USC Biomedical Engineering Center, a cooperative effort with the School of Medicine and the Los Angeles County Department of Hospitals, to apply engineering science and technology in improving health care.

Establishment of the graduate program in Environmental Engineering.

1971 Establishment of the USC Instructional Television Center in the School of Engineering for televising regular credit and continuing education programs to remote classrooms at business and industry locations throughout the greater Los Angeles area.

RESEARCH ACTIVITIES IN THE SCHOOL OF ENGINEERING

AEROSPACE
- Turbulence
- Control Theory
- Hypersonic Flow
- Flight Mechanics
- Rarefield Gas Dynamics
- Gas-Surface Interactions
- Boundary Layer Research
- Geophysical Fluid Mechanics

BIOMEDICAL
- Mathematical Modeling & Computer Simulation of Respiratory, Cardiovascular, Renal, Neuromuscular and Body Fluid Systems
- Neural & Endocrine Signals & Systems
- Estimation of Biological System Parameters
- Artificial Internal Organs
- Hospital Information Systems

CHEMICAL
- Reaction Kinetics
- Rubber Technology
- Phase Behavior
- Properties of Elastomers
- Multi-Component Distillation
- Thermal Conductivity of Liquids
- Properties of Non-Newtonian Liquids
- Enthalpy Measurement of Mixtures

CIVIL
- Stratified Fluids
- Dynamics of Shells
- Space Frame Analysis
- Sanitary Landfill Studies
- Impact Vibration Dampers
- Elastic-Plastic Behavior of Composite Materials
- Stochastic Excitation of Systems Equipped with Impact Dampers
- Impact Stresses and Deformations in Cylindrical & Spherical Shells
- Marine Structures
- Environmental Studies

COMPUTER SCIENCE
- Numerical Analysis
- Design Automation
- Formal Languages
- Artificial Intelligence
- Compiler Theory
- Parallel Processes
- Computer-Aided Instruction

ELECTRICAL
- Radar
- Control Systems
- Plasma Research
- Speech Processing
- Solid State Devices
- Quantum Electronics
- Information & Image Processing
- Applied Electromagnetics
- Network & Filter Theory
- Digital, Analog & Hybrid Computers
- Communication & Information Theory
- Automatic & Manual Control Systems
- Traffic Control & Transporation Systems

ENVIRONMENTAL
- Cellulose Conversion
- Landfill of Hazardous Substances
- Sulfide Oxidation
- Mercury Pollution
- Disposal of Oily Waste
- Toxic Metal in Coastal Waters
- Pollution of Harbors & Marinas

INDUSTRIAL & SYSTEMS
- Highway Safety
- Systems Approach to Solid Waste Management
- Capital Allocation Procedures
- Ecological Control Models
- Inventory Models
- Hospital & Health Services
- Health Organizations Research
- Optimal Strategies Relating to Commercial Fishing
- Reliability & Fatigue
- Data Conflict & Core Storage Assignment

MATERIALS SCIENCE
- Ceramics
- Luminescence
- Magnetic Materials
- Magnetic Resonance
- Electron Microscopy
- Imperfection Chemistry
- Electron X-Ray Microanalysis and Cathodoluminescence
- Semiconducting Compounds and Alloys
- Optical Properties of Semiconductor and Dielectric Materials
- X-Ray Diffraction & Structure Analysis
- Materials Preparation & Crystal Growth
- Strength of Materials

MECHANICAL
- Detonation
- Two-Phase Flow
- Zero Gravity Boiling
- Fluid Dynamic Noise
- Two-Phase Radiation
- Propellant Combustion
- Cross Connection Control
- High Velocity Air Distribution

OCEAN
- Ocean Instrumentation
- Harbor Resonance
- Interaction of Waves & Islands
- Interaction of Waves & Submerged Structures
- Marine Pollution
- Underwater Structures

PETROLEUM
- Reservoir Engineering
- Non-Darcy Flow in Porous Media
- Fluid Flow Through Porous Materials
- High-Pressure Compaction of Sediments
- Geochemical Exploration for Oil & Gas
- Effect of Electro-Potentials on Multiphase Flow in Porous Media
- Microscopic & Macroscopic Properties of Rocks

Founded in 1880, USC is the oldest major private coeducational university in the West.

Situated in Los Angeles, the campus consists of 81 buildings occupying 150 acres, including the 12-acre School of Medicine campus adjacent to the Los Angeles County-USC Medical Center. The Marine Science Center is located on Santa Catalina Island.

Academic divisions include the College of Letters, Arts & Sciences and 18 professional or specialized schools, the largest being the Schools of Business Administration, Education and Engineering.

Total enrollment is over 20,000, with over 10,000 enrolled in graduate or professional study. Full-time faculty numbers approximately 1400 which places USC in the top 2% of the 1647 four-year institutions in the United States.

Total degrees awarded since 1880 exceed 123,000 and, in Southern California today, alumni include 7500 engineers, 1700 physicians, approximately 40% of the attorneys and 48% of the judges.

Since initiation of the University's Master Plan for "Enterprise and Excellence in Education" in 1961, many major objectives have been attained including:

Receipt of $178 million in gifts, pledges, grants and loans for further development of the University.

Completion of 44 new buildings valued in excess of $64 million - more than in USC's first 81 years. 11 additional buildings totaling $32.5 million are in planning.

Election as the 48th member of the prestigious Association of American Universities, the most esteemed organization of academic institutions.

PHILIP S. BIEGLER
HALL OF ENGINEERING

ROBERT E. VIVIAN
HALL OF ENGINEERING & MATERIALS SCIENCE